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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/977,552	10/15/2001	Hank E. Millet	031500487DVA	4193
27572	7590	04/26/2004	EXAMINER	
HARNES, DICKEY & PIERCE, P.L.C.			SAYOC, EMMANUEL	
P.O. BOX 828			ART UNIT	
BLOOMFIELD HILLS, MI 48303			PAPER NUMBER	
			3746	

DATE MAILED: 04/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/977,552	Applicant(s) MILLET ET AL.	
	Examiner Emmanuel Sayoc	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to the amendments of 2/19/2004. In making the below rejections and/or objections the examiner has considered and addressed each of the applicants arguments.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. Applicant is instructed to include the most pertinent concepts or components of the claimed invention within the title.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 18-23, and 25-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Centers et al. (U.S. 6, 471, 486 B1) in view of Culp, III et al. (U.S. 5,975,854), and the applicant's admitted prior art.

With respect to claim 18, 21, 22, 29, and 30-34, in Figure 2A, Centers et al. discloses a compressor system and control system comprising a compressor(s) (1002) and an electronic control system(s) (1004), which is analogous to the claimed invention's control block. The

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electronic control system (1004) is in communication with the compressor (1002). Multiple compressors (1002) can be controlled at the same time, in which case multiple electronic control systems (1004) are linked via network in a peer to peer configuration – see abstract. A remote computer used for monitoring, controlling, downloading firmware software, and communicating compressor operation data constitutes a system master as in the claimed invention. The remote computer is in communication with the electronic control systems (1004) and is operative to receive and send stored compressor configuration information to and from the electronic control system (1004) – see column 25 line 42 to column 26 line 27. It is obvious that this computer initializes the configuration of the compressor. Random access memory chips (510) are used for storage of operating data, i.e. compressor configuration information, history data, and parameter calculation results – see column 19 lines 33-37. All operating parameters, service information, shut down records, sensor input information (including temperature and pressure data), are transmitted from the electronic control system (1004) to the system master computer. All of the stored operating parameters of the electronic control system (1004) can be modified by the system master computer – see column 15 lines 5-17. The device includes a motor (100), a shell (shown not enumerated), and obviously a compression mechanism in the shell.

The Centers et al. device differs from the claimed invention in that there is not explicit teaching of the control block/control system (1004), including a pluggable gateway. As disclosed in column 13 line 65, and column 14 lines 24-28, the control system (1004) includes a network interface connection (2013), among its multiple circuit boards, for connection of the control system (1004), and the compressor to the network, the master computer, and other compressors. This data interface constitutes a gateway board. Having detachable or pluggable

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interfaces on electronic control devices to accept network or data cables was well known in the art at the time the invention was made. The applicant on page 13 line 13, discloses a prior-art device, a Motorola Serial peripheral Interface, for accomplishing such a network connection. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify to Centers et al. device by using the pluggable interface, as taught by the applicant's admitted prior art, in order to data link the control systems in a control network.

The Centers et al. device differs from the claimed invention in that there is not explicit teaching of the control block being mounted on the compressor. As stated above the Center's device substantially discloses the control system of the claimed invention. Each compressor within the Centers et al. control system comprises an individual control block. This control block governs the compressor it is assigned to, and interacts with a system master and other control blocks in a peer-peer system. It is the examiner's position that the exact location of these control blocks does not sufficiently depart from the inventive concept of Centers et al. device. There is no significant difference between placing all the control blocks into one control room, and placing the control blocks on the compressors. Mounting a control block to the compressor it is assigned to would be obvious in order to integrate the design of the compressor, reduce control block to compressor wiring, i.e. network set up, and simplify control block to compressor identification.

Culp, III et al. teaches a compressor (10) with a terminal box assembly (28). The box contains within a protection module (86), which is analogous to the claimed invention's control box. The protection module, which includes vibration sensors, power supply circuits, and control circuits (Figure 4 and 7), is mounted on the compressor shell via the terminal box

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(column 6 line 61-62). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Centers et al. device, by mounting the control block on the compressor, as taught by Culp, III et al., in order to integrate the design of the compressor, reduce control block to compressor wiring, i.e. network set up, and simplify control block to compressor identification.

With respect to claim 19 and 20, the control system uses pressure and temperature sensors, among others, to detect or predict actual shutdown conditions based on the operating state of the compressor (1002). These signals are transmitted to the system master, and are indicative of an operating characteristic of the compressor – see column 9 lines 21-26.

With respect to claim 23, the stored compressor configuration information includes many compressor specific values such as model number/type – see column 27 line 37.

With respect to claim 25, the operating data, or configuration information includes at least one pressure limit, and at least one temperature limit. These limits are used as thresholds that predict abnormal compressor operation – see column 9 lines 10-15 (temperature), and column 9 lines 35-40 (pressure). The information also includes at least on time limit – column 17 line 33-38.

With respect to claim 26, the control system (1004) includes a microprocessor (500, Figure 2A-1)

With respect to claims 27 and 28, the microprocessor functions as a gateway for communicating with the system master. The various compressor sensors are connected to the control system (1004) via the microprocessor (500) and in turn to the system master wherein

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information from the compressors (1002) is communicated to the system master via the control system's (1004) microprocessor (500) – see columns 13 line 55 to column 15 line 57.

With respect to claim 30, the Centers et al., as modified by Culp, III et al., device differs from the claimed invention in that there is no disclosure of the system master selectively controlling the control blocks/control systems (1004). It is inherent that individual compressors, with their individual control systems (1004), are selectively controlled by the system master over the network. Compressors undergo different compression situations and the system master must be able to provide independent, and appropriate controls to the compressors.

5. In the alternate, claims 18-23, and 25-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Centers et al. (U.S. 6, 471, 486 B1), and the applicant's admitted prior art, as applied to structures outlined above, and further in view of Suzuki (U.S. 5,119,466), with respect to the control block mounting.

The Centers et al. device differs from the claimed invention in that there is not explicit teaching of the control block being mounted on the compressor. As stated above the Centers et al. device substantially discloses the control system of the claimed invention. Each compressor within the Centers et al. control system comprises an individual control block. This control block governs the compressor it is assigned to, and interacts with a system master and other control blocks in a peer-peer system. It is the examiner's position that the exact location of these control blocks does not sufficiently depart from the inventive concept of Centers et al. device. There is no significant difference between placing all the control blocks into one control room, and placing the control blocks on the compressors. Mounting a control block to the compressor it is assigned to would be obvious in order to integrate the design of the compressor,

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reduce control block to compressor wiring, i.e. network set up, and simplify control block to compressor identification.

Suzuki teaches a motor fan blower (Figure 3) with a control circuit assembly (40), which is analogous to the claimed invention's control box. The control circuit assembly, which includes switches, power supply circuits, and control elements (Figure 5), is mounted on the motor case (34) beneath the shroud (35). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Centers et al. device, by mounting the control block on the compressor, as taught by Suzuki, in order to integrate the design of the compressor, and reduce control block to compressor wiring.

6. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Centers et al., as modified by Culp, III et al., as applied to claim 31, and in further view of Friedland (U.S. 5,423,190), and Sunaga et al. (U.S. 6,035,661).

Centers et al., as modified by Culp, III et al., sets forth a device as described above, which is substantially analogous to the claimed invention. The Centers et al., as modified by Culp, III et al., device differs from the claimed invention in that there is no disclosure of the electronic control system (1004) containing compressor configuration information including a serial number of the compressor, a refrigerant code for the compressor, and an oil code for the compressor. Compressor information such as the model and serial numbers identify the specific parameters (usually provided by the manufacturer), such as intake pressure, discharge pressure, capacity, voltage/current inputs, or operating temperatures. Specific data, that is critical for control system to maintain optimal operation of the compressor is stored in a memory components (538, see column 20 line 52-67). In the same manner the working fluids, whether it

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be compressed air, gas, refrigerant, or oil need to be specified such that their thermodynamic properties can be specified for the control system. As seen above, Centers et al. anticipated the need for specific compressor parameter information. The properties of the compressor and its working fluid have been specified within the control system either directly, or indirectly through other parameters. Friedland in column 2, line 41-51 and column 6 lines 1-10, teaches the use of a compressor serial number to identify the type of refrigerant and amount of refrigerant used. It is common in compressors to use the refrigerant to lubricate the compressor, in which case refrigerant type would constitute the oil type. There are also cases where oil is mixed with the refrigerant, as is taught by Sunaga et al. in Table 4, and Table 5. Each table identifies refrigerant and associated oil. Applying a code to a refrigerant or oil would have been obvious for control scheme identification. Friedland teaches the use of a look-up table. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Centers et al. device by including into the control system (1004) pertinent information such as the compressor serial number, refrigerant code, and oil code, as taught by Friedland and Sunaga et al., for proper identification of the working compressor, its operating fluids, and the thermodynamic properties of its working fluids, using a memory stored look-up table.

Response to Arguments

7. Applicant's arguments, filed 2/19/2004, with respect to the rejection(s) under 35 U.S.C. 103(a), of claims 17-30, in view of Centers et al. and Culp, III et al., and Centers et al. and Suzuki have been fully considered and are not persuasive. Applicants amendments have been responded with new ground(s) of rejection is made in view of Centers et al., Culp III, et al., and the applicants admitted prior art – see above. The applicant by stating that neither cited

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reference teaches a compressor housing mounted control block, does not address the obvious type rejection based on the combined prior art, and is incorrect in view of Culp, III et al., who teach such a control block. Suzuki being an electric blower constitutes as being analogous to the compressor art.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are cited to further show the state of the art with respect to compressor control and protection systems.

U.S. Pat. 5, 713, 724 to Centers et al.

U.S. Pat. 4, 502, 842 to Currier et al.

U.S. Pat. 5,641,270 to Sgourakes et al. – teaches programming lookup tables in memory

U.S. Pat. 6,276,901 B1 to Farr et al. – teaches control block on compressor

U.S. Pat. 6,129,527 to Donahoe et al. - teaches control block on compressor

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Contact Information

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Sayoc whose telephone number is (703) 305-0054. The examiner can normally be reached on M-F 8 A.M. - 6 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Justine Yu can be reached on (703) 308-2675. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Emmanuel Sayoc
Examiner
Art Unit 3746

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4/24/04